CLAIMS

1. A method for reliably acquiring emitted-light intensity from the surface of a molecular array, the method comprising:

providing a probe-molecule excitation system;

providing an emitted-light photodetection system that produces an analog signal representative of the emitted-light intensity;

adding a signal offset to the analog signal;

digitizing the analog signal to produce a digital signal;

subtracting a portion of the signal offset from the digital signal; and

integrating the digital signal to produce integrated digital signals that are each associated with a pixel in a scanned image of the molecular array.

2. The method of claim 1 wherein the photodetection system outputs an analog current signal that is converted to an analog voltage signal.

3. The method of claim 1 further including:

prior to scanning a molecular array to acquire data, carrying out a dark scan with no molecular array in order to determine a mean intensity and standard deviation for background generated by components within the photodetection and the signal processing systems of the molecular array scanner.

4. The method of claim 3 wherein the portion of the signal offset subtracted from the digital signal is the signal offset minus four times the standard deviation of the background.

5. Signal intensity data scanned from the surface of a molecular array by the method of claim 1 encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.

6. A set of computer instructions for carrying out the method of claim 1 encoded by one of:

storing the computer instructions in a machine readable medium;

transmitting the computer instructions over an electronic communications medium; and

printing the computer instructions in a human readable medium.

7. A method for reliably acquiring emitted-light intensity from the surface of a molecular array, the method comprising:

providing a probe-molecule excitation system;

providing an emitted-light photodetection system that produces an analog signal representative of the emitted-light intensity;

digitizing the analog signal to produce a digital signal;

adding a signal offset to the digital signal;

integrating the digital signal to produce integrated digital signals; and

subtracting a portion of an integrated signal offset from the integrated digital signals to produce final, integrated digital signals that are each associated with a pixel in a scanned image of the molecular array.

8. The method of claim 7 wherein the photodetection system outputs an analog current signal that is converted to an analog voltage signal.

9. The method of claim 7 further including:

prior to scanning a molecular array to acquire data, carrying out a dark scan with no molecular array in order to determine a mean intensity and standard deviation for background generated by components within the photodetection and the signal processing systems of the molecular array scanner.

10. The method of claim 9 wherein the portion of the signal offset subtracted from the digital signal is the signal offset minus four times the standard deviation of the background.

11. Signal intensity data scanned from the surface of a molecular array by the method of claim 7 encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.

12. A set of computer instructions for carrying out the method of claim 7 encoded by one of:

storing the computer instructions in a machine readable medium;

transmitting the computer instructions over an electronic communications medium; and

printing the computer instructions in a human readable medium.

13. A molecular array scanner comprising:

a probe-molecule excitation system;

an emitted-light photodetection system that produces an analog signal representative of the emitted-light intensity;

an analog-to-digital converter that digitizes the analog signal to produce a digital signal;

a signal-offset adder that adds an offset to the digital signal;

a digital-signal integrator that integrates portions of the digital signal to produce integrated digital signals; and

a signal-offset subtractor that subtracts a portion of an integrated signal offset from the integrated digital signals to produce final, integrated digital signals that are each associated with a pixel in a scanned image of the molecular array.

14. The molecular array scanner of claim 13 further including:

a memory component that stores a value that allows for calculation of the portion of the signal offset subtracted by the subtractor.

15. The molecular array scanner of claim 13 further including:

dark scan logic that controls the molecular array scanner to carry out a dark scan with no molecular array in order to determine a mean intensity and standard deviation for background generated by components within the photodetection and the signal processing systems of the molecular array scanner prior to scanning a molecular array to acquire data.

16. The molecular array scanner of claim 15 wherein the dark scan logic wherein the portion of the signal offset subtracted by the subtractor is the signal offset minus four times the standard deviation for the background.

17. Signal intensity data scanned from the surface of a molecular array by the molecular array scanner of claim 13 encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.

18. A molecular array scanner comprising:

a probe-molecule excitation system;

an emitted-light photodetection system that produces an analog signal representative of the emitted-light intensity;

a signal-offset adder that adds an offset to the analog signal;

an analog-to-digital converter that digitizes the analog signal to produce a digital signal;

a signal-offset subtractor that subtracts a portion of the signal offset from the digital signal; and

a digital-signal integrator that integrates portions of the digital signal to produce integrated digital signals that are each associated with a pixel in a scanned image of the molecular array.

19. The molecular array scanner of claim 18 further including:

a memory component that stores a value that allows for calculation of the portion of the signal offset subtracted by the subtractor.

20. The molecular array scanner of claim 19 further including:

dark scan logic that controls the molecular array scanner to carry out a dark scan with no molecular array in order to determine a mean intensity and standard deviation for background generated by components within the photodetection and the signal processing systems of the molecular array scanner prior to scanning a molecular array to acquire data.

21. The molecular array scanner of claim 20 wherein the dark scan logic wherein the portion of the signal offset subtracted by the subtractor is the signal offset minus four times the standard deviation for the background.

22. Signal intensity data scanned from the surface of a molecular array by the molecular array scanner of claim 18 encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.

23. A molecular array scanner comprising:

a probe-molecule excitation system;

an emitted-light photodetection system that produces an analog signal representative of the emitted-light intensity;

a signal-offset adder that adds an offset to the analog signal;

an analog-to-digital converter that digitizes the analog signal to produce a digital signal;

a digital-signal integrator that integrates portions of the digital signal to produce integrated digital signals; and

a signal-offset subtractor that subtracts a portion of an integrated signal offset from the integrated digital signals to produce final, integrated digital signals that are each associated with a pixel in a scanned image of the molecular array.

24. The molecular array scanner of claim 23 further including:

a memory component that stores a value that allows for calculation of the portion of the signal offset subtracted by the subtractor.

25. The molecular array scanner of claim 24 further including:

dark scan logic that controls the molecular array scanner to carry out a dark scan with no molecular array in order to determine a mean intensity and standard deviation for background generated by components within the photodetection and the signal processing systems of the molecular array scanner prior to scanning a molecular array to acquire data.

26. The molecular array scanner of claim 25 wherein the dark scan logic wherein the portion of the signal offset subtracted by the subtractor is the signal offset minus four times the standard deviation for the background.

27. Signal intensity data scanned from the surface of a molecular array by the molecular array scanner of claim 23 encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.